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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/506,298

09/01/2004

Tsutomu Ohzuku

43888-325

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06/14/2007

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EXAMINER

ECHELMEYER, ALIX ELIZABETH

ART UNIT

PAPER NUMBER

1745

MAIL DATE

DELIVERY MODE

06/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/506,298	Applicant(s) OHZUKU ET AL.	
	Examiner Alix Elizabeth Echelmeyer	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9-1-04, 2-18-05, 8-15-05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. This Application is a 371 of PCT/JP03/01997, filed February 24, 2003. Additionally, priority is claimed to JP 2002-56490, filed March 1, 2002, and JP 2002-129134, filed April 30, 2002. Certified copies of those references have been received.

Information Disclosure Statement

2. The Information Disclosure Statements have been considered by the examiner.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koksang (US Patent 5,506,077) in view of Manev et al. (US Patent 5,766,800).

Koksang teaches a lithium battery having a positive electrode active material made of a manganese oxide (abstract). Koksang teaches that that manganese oxide may be $\text{LiNi}_{1/2}\text{Mn}_{3/2}\text{O}_4$ (Table 2).

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Regarding claim 3, in the compound above of Koksbang, the ratio of Mn to Ni, the other transition metal, is 3 to 1.

Koksbang et al. teach that the compound is formed by first mixing the various components (columns 3-5). Koksbang et al. fail to teach the first and second baking methods of the instant invention.

Manev et al. teach a highly homogeneous spinel lithium manganese oxide (title). The composition of Manev et al. could be modified to make the composition of Koksbang et al. by replacing $\frac{1}{4}$ of the manganese with nickel.

Manev et al. teach that the oxide may be formed by first baking the compound at 750°C to 900°C (900°C is not less than 900°C, as required by claim 9). The compound is then baked again at 600°C-750°C (which meets the limitations of claims 10, 11 and 12).

With regard to claims 13-15, the compound of Manev et al. is cooled at a cooling rate of greater than 50°C per hour. As for claim 16, it would have been obvious to one having ordinary skill in the art to cool the compound to room temperature if the skilled artisan wished to work with the compound, for example, in assembling a battery.

Manev et al. teach that the method described above is ideal for forming a spinel lithium manganese oxide compound since it creates a highly homogeneous compound that, when used as the positive electrode active material of a lithium battery, yields a battery having a high specific capacity and negligible capacity fade (column 2 lines 39-42).

It would be desirable to make the positive active material of Koksbang with the method of Manev et al. since it would create a material that was highly homogeneous and that, when used as the positive electrode active material of a lithium battery, would yield a battery having a high specific capacity and negligible capacity fade.

As for claims 2 and 4-7, since the compound of Koksbang and Manev et al. is made in the same manner as the compound of the instant invention, the features of these claims are inherent, since it has been held that products of identical chemical composition cannot have mutually exclusive properties. MPEP 2112.01 (II).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the positive active material of Koksbang with the method of Manev et al. since it would create a material that was highly homogeneous and that, when used as the positive electrode active material of a lithium battery, would yield a battery having a high specific capacity and negligible capacity fade.

5. Claims 17-22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koksbang in view of Manev et al. as applied to claim 1 above, and further in view of Michot et al. (US Pre-Grant Publication 2002/0055045).

The teachings of Koksbang and Manev et al. as discussed above are incorporated herein.

Koksbang in view of Manev et al. teaches a positive active material having the same characteristics of that of the instantly claimed invention. Koksbang teaches a nonaqueous electrolyte and separator in the battery (column 1 lines 13-37).

Koksbang in view of Manev fails to teach a titanium oxide negative electrode.

Michot et al. teach a negative electrode of spinel $\text{Li}_4\text{Ti}_5\text{O}_{12}$ and an aluminum current collector for a secondary electrochemical generator ([0073]).

Regarding claims 17 and 20, since the components of the battery of Koksbang, Manev et al. and Michot et al. are the same as the components of the instantly claimed invention, the properties of the battery as claimed would be inherent.

As for claim 22, the electrolyte of Michot et al. may be propylene carbonate ([0042]).

With regard to claim 25, it would have been obvious to one having ordinary skill in the art at the time the invention was made to experiment to determine the amount of negative active material and positive active material to produce the most efficient battery, since the active materials determine the amount of lithium ions that can produce electricity in the battery. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. MPEP 2144.05 (IIB).

It would be desirable to use the negative electrode and aluminum current collector of Michot et al. in the battery of Koksbang in view of Manev et al. since the negative material of Michot et al. is compatible with a lithium manganese oxide positive electrode material ([0044]).

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6. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koksbang, Manev et al. and Michot et al. as applied to claim 17 above, and further in view of Takami et al. (US Patent 5,079,109).

The teachings of Koksbang, Manev et al. and Michot et al. as discussed above are incorporated herein.

Koksbang, Manev et al. and Michot et al. fail to teach that the separator is a propylene porous film.

Takami et al. teach a nonaqueous electrolyte secondary battery with a lithium manganese complex oxide positive electrode (column 11 lines 39-57). The separator of that battery is porous propylene.

It would be desirable to use the porous propylene separator of Takami et al. in the battery of Koksbang, Manev et al. and Michot et al. since the porous propylene separator of Takami et al. is readily commercially available and chemically compatible in a lithium battery environment.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the porous propylene separator of Takami et al. in the battery of Koksbang, Manev et al. and Michot et al. since the separator of Takami et al. is known to work in a secondary battery having a lithium manganese complex oxide positive electrode.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alix Elizabeth Echelmeyer
Examiner
Art Unit 1745

aee

Susy Tsang-Foster
Susy Tsang-Foster
Supervisory Patent Exr